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NOTE FOR: VC/NIC

FROM : MG Atkeson
NIO/GPF

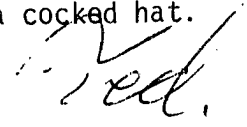
SUBJECT : Oil -- Does It Have a Future?

I think did a good job of documenting conventional wisdom.

STAT

Just for fun, you might take a look at the attached. Note that over the last four years oil imports and consumption dropped rather steadily no matter what happened to industrial production or GNP. (Look at Japan!)

Also attached is an item from The Wall Street Journal which talks about the kind of diminishing energy requirements which I suspect are occurring all over the place and which I believe are likely to knock our old models in a cocked hat.


Edward B. Atkeson

Attachments:
As stated

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New Integrated Circuits May Spur Semiconductor Industry

By RICHARD A. SHAFFER
Staff Reporter of THE WALL STREET JOURNAL

ALTHOUGH THEY HAD spent their careers working with semiconductors, L.J. Sevin and Benjamin M. Rosen decided to avoid that industry when they formed a venture-capital company two years ago. Other fields looked far more promising to the two men.

But now, despite the industry's prolonged slump, the former electronics executive and the one-time securities analyst are about to try raising a substantial sum to finance a new semiconductor manufacturing business. What's changed is the outlook for a technology known as CMOS.

CMOS circuits are known for their low power consumption and high reliability.

A specialty technology for most of its life, CMOS is coming to the forefront as manufacturers seek ways to make smaller, more portable or more efficient computers, telephones and other electronic products. "Everybody is moving in that direction," says William I. Strauss of Integrated Circuit Engineering Corp., a consulting company.

Some industry people believe CMOS will become the decade's dominant integrated circuit technology. And at least a few think CMOS expertise could give U.S. companies an edge over the Japanese in microprocessors and in sales of the semiconductor industry's first billion-dollar-a-year product, the 64K dynamic RAM, a circuit that can remember about 64,000 basic units of computer information.

CMOS, WHICH STANDS for complementary metal-oxide semiconductor, is a blend of two older technologies, NMOS and PMOS, that use an electric field to control the flow of current in a transistor. In NMOS, the flowing charge is negative. In PMOS, it's positive.

CMOS circuits are known for their low power consumption and high reliability.

Despite such economy, their slowness and bulk have kept CMOS circuits from becoming very popular. But lately, advances in making the gate, or main control terminal, of a transistor out of silicon instead of aluminum, have resulted in CMOS circuits that are about as fast and compact as other technologies and only slightly more expensive.

CMOS circuits, which contain fewer transistors than NMOS equivalents, also are easier to design. And design, especially in the case of such complex circuits as electronic memories, can be a lengthy and expensive process.

Because it generates less heat, CMOS could become the preferred technology for the next generation of one-chip microprocessors, those that can manipulate digital information 32 bits, or basic units, at a time. So many circuits are squeezed onto single slices of silicon in today's 16-bit microprocessors that more conventional technologies are at the limit of what will operate in an ordinary package without melting. Both Intel and Motorola, for example, have chosen CMOS for new 32-bit computers.

LATER THIS YEAR, Harris Corp., one of the CMOS pioneers, plans to introduce the first 16-bit microprocessor in CMOS, a version of Intel's 8086, and to produce a CMOS version of Digital Equipment Corp.'s PDP-11 minicomputer.

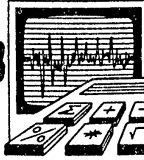
Because of their interest in making battery-powered electronics products, the Japanese—notably Hitachi and Toshiba—have developed a lead in CMOS technology. But Intel is set to challenge that lead next week in New York at the International Solid State Circuits Conference, the premier engineering meeting in semiconductors. In a paper to be presented on Wednesday, Intel is to describe the world's first CMOS dynamic RAM. (RAM stands for random access memory.)

CMOS is immune to the forgetfulness that plagues electronic memories of other kinds when struck by the sub-atomic particles that are always wandering about. In a computer with an ordinary electronic memory, the particles might cause one bit of information to go awry every couple of months, and even more frequently if the computer's memory were very large. Stray particles, by contrast, would cause only one memory error every two-and-a-half years if the same computer were to use Intel's new circuit.

IN ADDITION, the Intel chip can, when needed, disgorge its data in large groups of bits, using a technique known as ripple mode. As a consequence, for computer graphics and other high-speed needs, the chip can deliver its information at rates as high as 24 million bits a second. That compares with about four million bits a second in conventional dynamic RAMs.

"Intel's done an excellent job," says T.J. Rodgers of Woodside, Calif., who recently left Advanced Micro Devices to establish Cypress, the CMOS-products company that Mr. Sevin and Mr. Rosen plan to finance. "If they can make the chip at a reasonable cost—and that could be a big if—the part could position Intel to cream off the really high-quality business."

The CMOS memory circuit, which is expected to be shipped later this year, also is regarded as a test of Intel's approach to more capacious memory circuits, such as those that can store a quarter-million, or even a million, characters of information. "The Intel part is interesting in itself," says Canadian microelectronics authority Dick Foss, "but it may be even more interesting because CMOS looks like it may be a good way to solve the thorny problems that will almost certainly become worse with the next generations of memory circuits."



	1979	1980	1981	1982	1982				
					1st Qtr	2d Qtr	Oct	Nov	Dec
United States ^a	18,513	17,006	16,058	15,175	15,797	15,275	14,820	14,785	14,819
Japan	5,171	4,674	4,444		4,643	3,784	3,828		
West Germany	2,664	2,356	2,120		2,169	2,007	1,867		
France	2,107	1,965	1,744	1,645	1,841	1,604	1,607	1,739	1,814
United Kingdom	1,690	1,422	1,325		1,511	1,277	1,321		
Italy ^b	1,620	1,602	1,705		1,801	1,530	1,554	1,652	
Canada	1,765	1,730	1,617		1,580	1,366	1,313	1,472	

^a Including bunkers, refinery fuel, and losses.^b Principal products only.**Big Seven: Crude Oil Imports**

Thousand b/d

	1979	1980	1981	1982	1982				
					1st Qtr	2d Qtr	Oct	Nov	Dec
United States	6,519	5,220	4,406	4,033	3,303	3,603	3,636	3,556	3,099
Japan	4,846	4,373	3,919		3,335	3,247	3,403	4,083	
West Germany	2,147	1,953	1,591		1,550	1,529	1,438		
France	2,520	2,182	1,804		1,473	1,413	1,285	1,358	
United Kingdom	1,157	893	736		565	547	506		
Italy	2,292	1,860	1,816		1,602	1,617			
Canada	616	557	521		335	281			

Industrial ProductionPercent Change From Previous Period
(Seasonally Adjusted at an Annual Rate)

	1979	1980	1981	1982	1982				
					3d Qtr	4th Qtr	Oct	Nov	Dec
United States	4.4	-3.6	2.6	-8.1	-3.4	8.6	-12.4	-8.5	-0.9
Japan	8.2	6.8	3.1		6.5		-30.7	32.1	
West Germany	5.4	-0.8	-2.7	-3.2	-12.6	7.6	-20.5	31.8	-11.3
France	4.5	-1.0	-2.3		14.6		20.8		
United Kingdom	2.5	-6.5	4.6		1.9		4.6	-13.3	
Italy	6.7	5.5	3.6		31.3		39.2	43.1	
Canada	5.3	-2.0	2.8		10.4		-36.0	4.2	

Gross National ProductPercent Change From Previous Period
(Constant Market Prices; Seasonally Adjusted at an Annual Rate)

	1979	1980	1981	1982	1981	1982				
					3d Qtr	4th Qtr	1st Qtr	2d Qtr	3d Qtr	4th Qtr
United States	2.8	0.4	1.9	-1.8	2.2	-5.3	5.1	2.1	0.7	-2.5
Japan	5.2	4.2	4.5		3.5	-1.1	1.5	8.0	2.5	
West Germany	4.0	1.8	-0.2		2.8	0.6	1.5	-1.3	5.0	
France	3.3	1.1	0.2		0.8	3.8	0.4	3.8		
United Kingdom	1.0	1.4	-2.2		-5.4	7.1	3.5	0.2	-1.9	
Italy	4.9	3.9	-0.2		-6.6	10.6	5.1	-5.9	11.5	
Canada	2.9	0.5	3.1		-4.3	-3.5	-8.5	-7.6	-3.9	